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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/550,504

09/22/2005

Tomohiro Yamada

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02/21/2008

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EXAMINER

GUGLIOTTA, NICOLE T

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

02/21/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/550,504	<b>Applicant(s)</b> YAMADA, TOMOHIRO	
	<b>Examiner</b> NICOLE GUGLIOTTA	<b>Art Unit</b> 1794	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 5 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### **Summary of Applicant's Claims**

1. Applicant claims a ceramic filter resembling that of a honeycomb structure, comprising filtration membranes on the inner partition wall surfaces of the main flow passages (hexagonal cells in drawings). In a cross-section perspective of the filter, first specific main flow passages (heptagonal cells) line up along the rectangular cells, which create two parallel lines apart at a specific distance (a row of rectangular cells). These heptagonal or "superior to heptagonal shaped" cells are arranged between the second specific main flow passages (rectangular cells) and the main flow passages (hexagonal cells). These heptagonal cells have angles of  $135 - 160^\circ$ . The heptagon sides flushed against the rectangular cells (A) are  $0.3B - 0.7B$ , B being the diameter of the heptagon. The fluid is allowed to permeate the inner walls of the main flow passage cells, comprised of a filtration membrane, and inside of the porous body to be purified.

The ceramic filter with predetermined main flow passages (hexagonal cells) whose opposite end-surface openings are plugged, slit-like auxiliary flow passages (rectangular cells) are formed in portions including the outer peripheral surface of the porous body so that the second specific main flow passages (rectangular cells) communicate with an external space. The cross section shapes of rows of second specific main flow passages (rectangular cells) and rows of main flow passages

(hexagonal cells), is a repeated pattern (2 – 8 rows of main flow passages), which are arranged subsequently to one row of second specific main flow passages.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 - 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuo et al. (JP 2000-342920, English Translation).

3. In regard to claim 1, Yasuo et al. teaches the same ceramic honeycomb filter claimed by applicant. There would be a main flow passage of hexagonal cells, as well as second specific main flow passages of rectangular cells. Yasuo et al. disclose the monolith type filter preferably has pentagonal or higher degree of polygonal cells, making the corner angle 90° or more, and more preferably has cells of corner angle much more than 90° (e.g. hexagonal cells) or circular cells, which have no corners (Sections 0006, 0024, English Translation).

4. Yasuo et al. disclose an octagon-like shape from a rectangular cell in order to overcome disadvantages resulting from the rectangular cell (Section 0033). An octagon-like shape trimmed from a rectangle would be irregular in shape and have

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greater than 7-sides. The angles of a regular octagon are  $135^\circ$ . Therefore the disclosure by Yasuo et al. is within the scope of applicant's amended claim.

5. In regard to claim 2, 2 or more sets of parallel lines, each set comprising two parallel lines, can be easily seen by Drawings 1a, 3a, 3b, 5 and 4a. Yasuo et al. also describe these parallel lines in Sections 0027 and 0029.

### Invention of Applicant

FIG. 1(b)

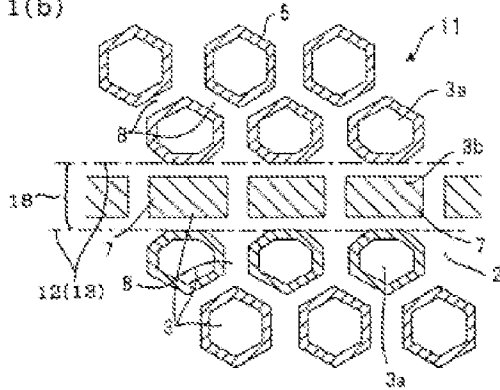
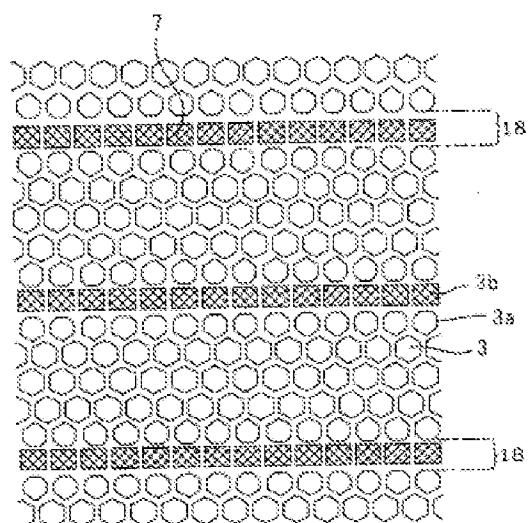
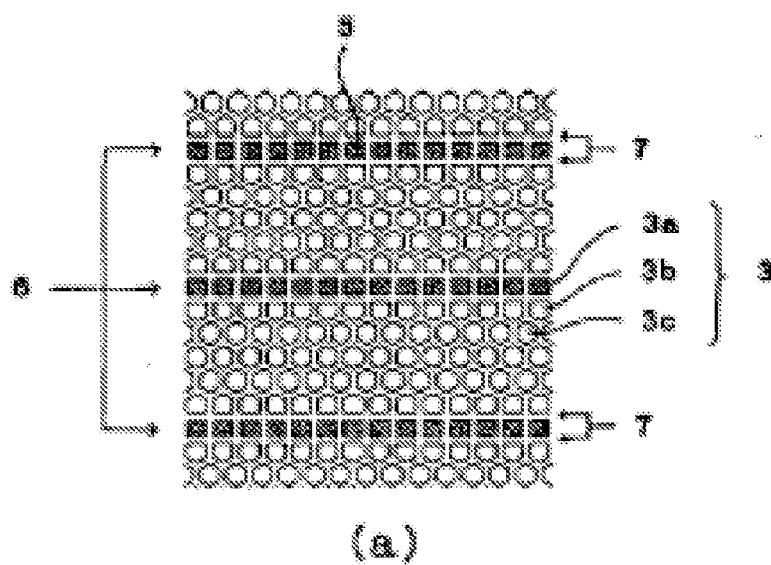


FIG. 6



Invention of Yasuo et al.



6. In regard to claim 3, Yasuo et al. teach an outside diameter of 180 mm x the length of 1000 mm (Section 0034).
7. In regard to claim 4, the "slit-like auxiliary flow passages" claimed by applicant are described by Yasuo et al. in Sections 0035, 0037. In a larger filter, some of plural numbers of cell lines may be broken to form slit-like space (corresponds to applicant's "slit-like auxiliary flow passages" which connect part of the cells to the external space (Section 0035). The opening of the slit-forming cell at the edge of the substrate is hermetically sealed with sealant in order to prevent contamination of the filtered liquid with the raw liquid because the raw liquid does not flow into the area (Section 0039).
8. In regard to claim 5, Yasuo et al. teach a total of 18 straight-line-like cell walls formed on both sides of a nine-row cell train (Section 34). Drawings 1a and 5 demonstrate 3 main flow passages arranged subsequently to one row of second specific main flow passages. Drawing 4a demonstrates 5 main flow passages arranged subsequent to one row of second specific main flow passages.
9. In regard to claim 3, 180 is greater than 70, therefore falls within range claimed by applicant for the maximum diameter of the ceramic filter.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1 – 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yorita et al. (U.S. Patent No. 5,855, 781).

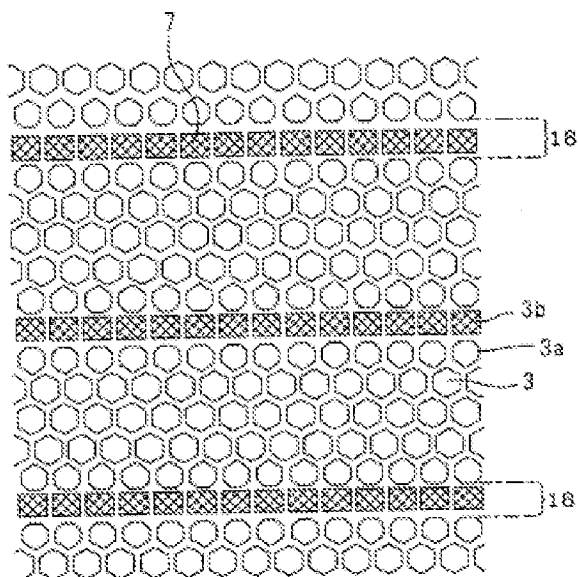
12. In regard to claim 1, Yorita et al. disclose a monolithic ceramic filter comprising filtrate discharging conduit openings and communication voids separated from cells of a honeycomb structure of the filter by cell partition walls, with the voids and conduit opening being in communication with the lateral outside of the honeycomb structure. The voids continue axially through the honeycomb structure and the conduit openings are perpendicular to the long axis of the honeycomb (Column 2, Lines 18 – 23, Column 6, Line 62 – Column 7, Line 6). The filtrate discharging conduit openings (14) are equivalent to applicant's slit-like auxiliary flow passages (Column 5, Lines 8 – 13, Figures 2 & 3). Filtration through a filtration membrane before the filtrate is purified inside the porous ceramic walls and discharged out of an outer wall (Column 3, Lines 23 – 39, and Fig. 10). The cross-section cells may be other polygonal shapes, besides squares. Therefore, heptagonal shapes and irregular polygons may also be used. (Column 5, Lines 61 – 64).

13. In regard to claim 2, Yorita et al. teach two or more sets of parallel lines, each set comprising two parallel lines (Fig. 2).

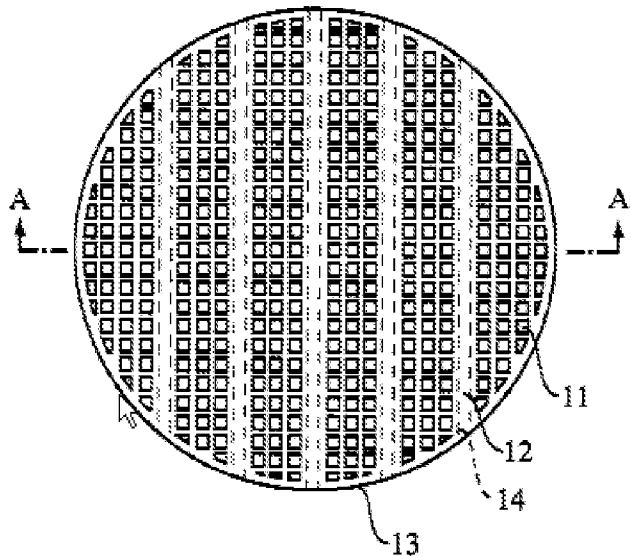


**Invention of Applicant**

FIG. 6



**Invention of Yorita et al.**



**FIG. 2**

14. In regard to claim 3, Yorita et al. teach the supporting member to have a diameter and a length of 150 mm (Column 6, Lines 34 – 35).

15. In regard to claim 4, Yorita et al. teach end frames with extrusions engaged in the communication voids or the groove-shaped recesses to close the communication voids at the end of the honeycomb structure (Column 2, Lines 35 – 39, Column 5, Lines 39 - 51). These are equivalent to applicant's plugged end-surface openings of main flow passages.

16. In regard to claim 5, it is evident by Figures 1 & 2 in the Yorita et al. that a repeated pattern of rows of main flow passages, which are arranged subsequently to one row of second specific main flow passages.

17. It would be obvious to one skilled in the art at the time the invention was made to manufacture a ceramic honeycomb with main flow passages and secondary passages that communicate with the outside of the structure. While Yorita et al. may use different polygon shapes, it has been stated in their patent that any polygon shape may be used for the cross-section cells and the transverse cells. Yorita et al. does not speak of main flow passages vs. first specific main flow passages because it is unnecessary. All of the raw fluid supply passages (equivalent to main flow passages and first specific main flow passages) are of the same polygon shape. However, changing the shape of selected cells and referring to them by a different name does not change their function. What the applicant refers to as main flow passages and specific main flow passages serve the same purpose. The partition wall (12) and filtrate discharge openings (14) of U.S. Patent No. 5,855, 781 serve the same purpose as applicant's specific partition wall part and second specific main flow passage, respectively.

## **DETAILED ACTION**

### ***Response to Arguments***

18. Applicant's arguments filed December 19, 2007 have been fully considered but they are not persuasive. See arguments made below.

***Specification***

19. Examiner acknowledges replacement of the old abstract with a new abstract. Examiner notes the new abstract is less than 150 words and therefore the objection is withdrawn.

***Claim Rejections - 35 USC § 112***

20. Examiner acknowledges applicant's amendment to claim 1 in response to the rejection for clarification of the term "superior". Examiner is satisfied with the amendment and the objection is withdrawn.

***Claim Rejections - 35 USC § 103***

**21. In regard to claims 1- 5, rejected over Yorita**

22. Applicant's arguments with respect to claims 1 - 5 have been considered but are moot in view of the new ground(s) of rejection.

23. Applicant amended claims to say "irregular polygons with seven or more sides" and "the angles are in the range of 135° to 160°". Applicants argue Yorita fails to disclose or suggest each and every feature recited in claim 1. Yorita et al. disclose the cross-section cells may be other polygonal shapes, besides squares. Examiner takes the position "other polygonal shapes" includes irregular polygons. In regard to the

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range of the angle sizes, whether the cells are irregular or regular, there are numerous polygons that have an angle between  $135^{\circ}$  and  $160^{\circ}$  (i.e. regular or irregular octagons). Therefore applicant's arguments are not persuasive and the rejection is maintained.

**24. In regard to claims 1 - 5, rejected over Yasuo, in view of LaBarge**

25. Arguments are not persuasive.

26. Applicant amended claims to say "irregular polygons" and "the angles are in the range of  $135^{\circ}$  to  $160^{\circ}$ ".

27. Applicants argue PTO applied LaBarge only with respect to the claimed polygonal cross-sectional shape of the cells (i.e., seven or more sides), which the PTO admitted is not taught in JP '920 (Yasuo et al).

28. Applicant argues JP '920 does not disclose the claimed angles and reference side length limitations, or that at least the first main fluid passages, particular those on either side of the specific partition wall, are irregular polygons having seven or more sides.

29. The Examiner was basing the lack of support for polygons with seven or more sides from JP '920 the abstract figures and a machine translation because an accurate English translation of JP '920 was not available. Now that an accurate English translation is available, the Examiner notes Yasuo et al. does disclose a polygon of greater than seven sides.

30. Yasuo et al. disclose the monolith type filter preferably has pentagonal or higher degree of polygonal cells, making the corner angle  $90^{\circ}$  or more, and more preferably

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has cells of corner angle much more than  $90^\circ$  (e.g. hexagonal cells) or circular cells, which have no corners (Sections 0006, 0024, English Translation).

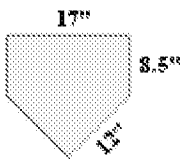
31. Yasuo et al. disclose an octagon-like shape from a rectangular cell in order to overcome disadvantages resulting from the rectangular cell (Section 0033). An octagon-like shape trimmed from a rectangle would be irregular in shape and have greater than 7-sides. The angles of a regular octagon are  $135^\circ$ . Therefore the disclosure by Yasuo et al. is within the scope of applicant's amended claim.



32.

33. In addition, Yasuo et al. discloses the use of irregular polygons in Figure 1, displaying embodiment 1 of the invention of Yasuo et al. The pentagons are (3b) to be irregular in shape, similar to the home base of the baseball game (Section 0049).

34. THE GEOMETRY OF HOME PLATE IN BASEBALL:



35. (<http://www.jimloy.com/geometry/plate.htm>)

36. Applicant defines an irregular polygon as having sides that are not equal in length. Clearly a home plate of a baseball game is an irregular polygon, as shown above. Therefore, when Yasuo et al. disclose the polygons may be pentagonal or a higher degree of polygonal cell, it is can be easily assumed by one skilled in the art at the time the invention was made that the polygonal cells with more than five sides may

also be irregular in shape. Therefore applicant's arguments are not persuasive and the rejection is maintained.

37. Applicant argues the data and results on page 29 of the present specification show that unexpected results occurred with respect to the significant difference between the number of defects and the defect ratio in the example, which corresponds to the claimed invention, and those of the comparative example, which corresponds to JP '920, when the only structural difference between the example and comparative example is the size and shape of the fluid passages.

38. Arguments are not persuasive. The comparative example applicant refers to, based upon Figure 7, which is the invention of Yasuo et al. with irregular pentagons. However, as argued above, Yasuo et al. also teaches a monolith-type filter with pentagonal or a higher degree of polygonal cell, i.e. irregular octagonal cells. Section 0033 of the English translation of Yasuo et al. suggests the increase in the angles of the cell improves the efficiency of the honeycomb by trimming a rectangular cell into an octagonal one. Applicant's data on page 29 simply gives quantitative data for what Yasuo et al. disclosed qualitatively. Therefore, applicant's invention lacks novelty and the rejection is maintained.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE T. GUGLIOTTA whose telephone number is (571)270-1552. The examiner can normally be reached on M - Th 8:30 - 6 p.m., & every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NICOLE T. GUGLIOTTA  
Examiner  
AU 1794

/Carol Chaney/

Supervisory Patent Examiner, Art Unit 1794